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IS 4910-8 (1989): Tyre yarns, cords and tyre cord warpsheets made from man-made fibres - Method of test, Part 8: Thickness [TXD 1: Physical Methods of Tests]



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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

**TYRE YARNS, CORDS AND TYRE CORD
WARPSHEETS MADE FROM MAN-MADE
FIBRES—METHODS OF TESTS**

PART 8 THICKNESS

(*First Revision*)

भारतीय मानक

कृत्रिम रेशों से निर्मित सूत डोरी और टायर
डोरी ताना चद्दरें — परीक्षण पद्धतियाँ

भाग 8 मोटाई

(पहला पुनरीक्षण)

UDC 677·072·6 : 629·11·012·553·1 : 677·017·224

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BUREAU OF INDIAN STANDARDS
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FOREWORD

This Indian Standard (Part 8) (First Revision) was adopted by the Bureau of Indian Standards on 15 July 1989, after the draft finalized by the Physical Methods of Test Sectional Committee had been approved by the Textile Division Council.

This standard was first published in 1970 and has been revised to incorporate changes on the basis of experience gained during its use.

In the preparation of this standard, due weightage has been given to the testing practices being followed in the country in this field.

This standard (Part 8) forms a part of a series of standards under the title 'Methods of test for tyre yarns, cords and tyre cord warpsheets made from man-made fibres'. The other parts under the series are:

- IS 4910 (Part 1) : 1989 Definition of terms
- IS 4910 (Part 2) : 1989 Linear density
- IS 4910 (Part 3) : 1989 Load and elongation characteristics
- IS 4910 (Part 4) : 1989 Dip pick-up
- IS 4910 (Part 5) : 1989 Head shrinkage and heat shrinkage force
- IS 4910 (Part 6) : 1989 Wet contraction and wet contractile force
- IS 4910 (Part 7) : 1989 Heat degradation
- IS 4910 (Part 9) : 1978 Sampling for tyre yarns, cords and tyre fabrics made from rayon
- IS 4910 (Part 10) : 1989 Creep
- IS 4910 (Part 11) : 1989 Commercial mass
- IS 4910 (Part 12) : 1989 Sampling for tyre yarns, cords and tyre cord fabrics made from polyamide
- IS 4910 (Part 13) : 1989 Static adhesion of textile tyre cord to vulcanized rubber

In reporting the results of a test made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'.

*Indian Standard***TYRE YARNS, CORDS AND TYRE CORD
WARPSHEETS MADE FROM MAN-MADE
FIBRES — METHODS OF TESTS****PART 8 THICKNESS***(First Revision)***1 SCOPE**

1.1 This standard (Part 8) prescribes a method for determination of thickness (gauge) of man-made fibre tyre cords taken from cheeses, cones, bobbins, spools, or tyre cord warpsheets.

2 PRINCIPLE

2.1 The average thickness of a group of parallel tyre cords resting on an anvil is determined when a specified pressure is applied by the presser foot of a thickness gauge.

3 SAMPLING

3.1 Sample from the lot shall be drawn so as to be representative of the lot. Sample drawn in accordance with the relevant material specification or as agreed to between the buyer and the seller shall be held to be representative of the lot.

**4 ATMOSPHERIC CONDITIONS FOR
CONDITIONING AND TESTING**

4.1 Unless otherwise agreed to between the buyer and the seller, the test sample shall be conditioned to a state of moisture equilibrium from the dry side in the standard atmosphere at 65 ± 2 percent relative humidity and $27 \pm 2^\circ\text{C}$ temperature. A standard temperature of $20 \pm 2^\circ\text{C}$ may also be used provided it is declared in the test report.

NOTE — When a test sample under zero tension has been left in such a way as to expose, as far as possible, all portions of it to the standard atmosphere for 24 hours, the test sample shall be deemed to have reached a state of moisture equilibrium.

4.2 The test shall be carried out in the standard atmosphere.

5 APPARATUS**5.1 Thickness Gauge Tester**

The instrument used for measuring thickness of tyre cords shall be provided with the following

arrangements:

- a) A circular presser foot of 9.5 mm diameter;
- b) A circular anvil having diameter at least 10 mm larger than that of the presser foot;
- c) Means to apply pressure of 24 mN/mm² to the specimens;
- d) A dial or gauge graduated in mm and capable of reading to an accuracy of 0.01 mm; and
- e) Means for adjusting zero reading on the dial.

NOTE — Any other apparatus capable of applying the same pressure of 24 mN/mm² may also be used.

5.1.1 The presser foot and the anvil surfaces shall be plain and parallel to each other within 0.001 mm and the movement of the presser foot relative to the anvil shall be at right angles to the surfaces of the parallel plates.

6 PROCEDURE

6.1 Take a specimen composed of four cords from the sample and handle the cords in such a manner that no change of twist can occur.

6.1.1 For tabby samples of tyre cord warpsheet prior to removing each set of four cords, position the cords such that they are adjacent and parallel with no ends crossed.

6.1.2 Grasp the four cords so that the length of the cords between the finger tips of the left hand and the right hand is approximately equal to the length of the anvil.

6.1.3 Inspect the top and bottom of the specimen to be sure that no knots/splices/foreign protuberances are present on the length of the cords to be gauged.

6.1.4 Place the four cords side by side on the anvil and directly under the presser foot of the thickness gauge.

6.1.5 Apply sufficient tension to make the cords straight. Lower the presser foot gradually and gently. Wait until gauge reading becomes stable and record the thickness of the specimen.

6.2 Similarly take at least four more readings from other test samples, find the average of all the readings and report it as thickness (gauge) of the tyre cord correct to 0.01 mm.

7 REPORT

7.1 The report shall include the following

information:

- a) Type of material tested,
- b) Diameter of presser foot,
- c) Pressure applied,
- d) Number of readings taken,
- e) Thickness (gauge), and
- f) Temperature used for conditioning, that is, $27 \pm 2^\circ\text{C}$ or $20 \pm 2^\circ\text{C}$.

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